

June 9, 2004

TO: G. Burke

FROM: A. Andujo

SUBJECT: ST-5 Preliminary Study

This study is in response to a request from the ST-5 mission. The purpose of this study is to evaluate the DSN's ability to support the ST-5 mission requirements.

Reference information was acquired using the FASTER (Forecasting and Scheduling Tool for Earth-based Resources) forecasting system, TIGRAS (TMOD Integrated Ground Resource Allocation System) scheduling tool and the updated mission set database from the February 2004 Resource Allocation Review Board (RARB). Other information used was acquired from Bob Shendock in the form of the events and user loading profile submitted May 26, 2004.

Summary of Results

This study was completed without entering the ST-5 loading in to the FASTER database as no usable viewperiods are yet available.

The requirements and trajectory of the ST-5 mission designate it as a Low Earth Orbiter; as such the mission is typically not supported by the DSN, except during launch, emergency and backup support periods. The Deep Space Network is geared primarily for the needs of the deep space and high Earth orbiting missions. The DSN is, and always will be capable of supporting all trajectory types, but due to the nature of the Low Earth Orbiting mission's short and more frequent viewperiods, the multiple supports may interfere in allowing a deep space mission from acquiring a large block of time. Particularly with ST-5 in that it is a multiple spacecraft mission possibly requiring simultaneous support from multiple antennas.

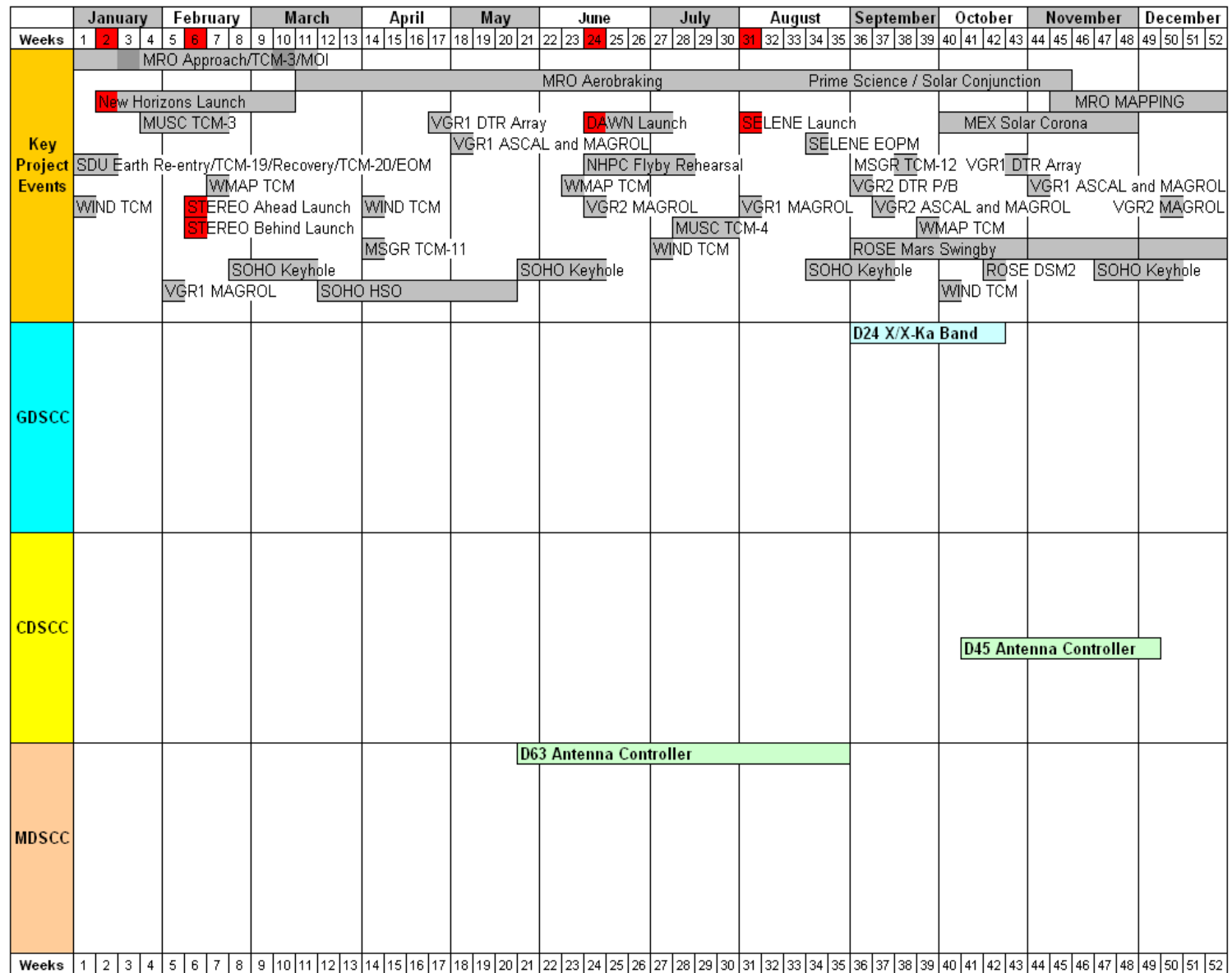
During launch weeks 11 - 23 of 2006 it is unlikely that the DSN would be able to fulfill the requirements requested. In week 09 and 10 of 2006, requested support would cause a tremendous burden on DSN resources and all other missions and would likely not be supportable by the DSN. This updated ULP illustrates a tremendous increase to requirements since the original ULP was submitted in 2002. (See Figures 1 and 2)

During the three months of the ST-5 mission we have identified several critical events that will most likely limit the DSN's ability to support ST-5. (See Figure 3)

Recommendations

It is our recommendation that the ST-5 mission use the DSN to supplement launch support, critical events and backup support as well as for periods when sites other than the DSN may have better access to the spacecraft than other networks.

Figure 3: Major DSN Antenna Downtime Chart 2006



Revised: June 4, 2004

As always, the results of this study are subject to change, in that network loading changes as requirements for planned missions are input and updated and periods of antenna downtime are identified. We will continue to work with ST-5 and other users of the DSN to maximize the time available for each individual user.

cc:

C. Abramo
R. Bartoo
D. Morris
S. Guduru
E. Hampton
N. Lacey